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FEDERAL COMMUNICATIONS COMMISSION
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Guidelines for Evaluating
Environmental Effects of
Radiofrequency Radiation

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ET Docket No. 93-62

To: The Commission

**COMMENTS OF
LINEAR CORPORATION**

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SUMMARY

Linear Corporation comments on the Commission's Notice of Proposed Rulemaking, In the Matter of Guidelines for Evaluating Environmental Effects of Radiofrequency Radiation, and requests that the Commission not adopt the 1992 ANSI/IEEE standard.

Linear contends that the adoption of the 1992 ANSI/IEEE standard will place an arbitrary and undue economic burden on the electronics industry and commercial and amateur radio station operators because the testing required to comply with the standard is extremely expensive, and because there is no scientific support for the proposition that low-powered, unlicensed radio devices are a threat to human health.

Linear contends that it is doubtful that the 1992 ANSI/IEEE standard was created with the intent that it might be adopted as law. Furthermore, the electronics industry had no opportunity to observe or participate in the scientific studies used to create the standard. As a result, it is doubtful that adequate due process protections accompanied the promulgation of the proposed rule.

Therefore, Linear requests that in consideration of the unnecessary and unjustified burden that the standard would place on the electronics industry and commercial and amateur radio station operators, the Commission not adopt the 1992 ANSI/IEEE standard.

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Introduction

The American National Standards Institute (ANSI) and the Institute of Electrical and Electronic Engineers (IEEE) are outstanding organizations which have made many valuable contributions in the field of electrical research. However, for the reasons set forth herein, it would be both procedurally inappropriate and practically detrimental for the Federal Communications Commission to adopt the 1992 ANSI/IEEE standard for RF exposure.

The Commission's Duty

The Commission's duty in the promulgation of rules is to insure that its efforts will promote the public interest. To accomplish this often daunting task, the Commission must attempt to balance complex interests, insure that a healthy competitive environment exists in the field of telecommunications, and take action which will enable manufacturers to continue to provide cost-effective, safe, reliable radio devices to the public. The rules proposed in

this proceeding, although appearing to serve the needs of consumer safety, do not satisfy all of the criteria necessary to assure that reasonable, necessary regulation will be adopted.

Most notable is the Commission's proposal to apply its new standards to unlicensed devices, authorized under Part 15 of the Commission's Rules. Such application is unnecessary, overly burdensome and does not comport with logic. Additionally, and not incidentally, the result of adoption of the Commission's proposed rules will have an extremely detrimental effect on small businesses, entrepreneurs and the public interest in the continued availability of low-cost, unlicensed radio devices.

The testing proposed is extremely expensive. It requires uses of anechoic chambers, screen rooms, highly sensitive receive equipment and antenna arrays, and other specialized equipment. The cost of obtaining such equipment is impossible for small businesses. Even medium sized corporations will have great difficulty in justifying the cost of obtaining such an expensive testing facility. One must assume, therefore, that the Commission proposes to place these entities at the mercy of commercial facilities which will provide such studies.

At this time, testing facilities typically maintain equipment to test up to 40 GHz, in accord with the Commission's existing rules. The proposed rules would require that commercial testing facilities obtain the capacity to test up to 300 GHz. Obviously, the extreme cost of buying the additional test equipment would be passed onto the small companies which must avail themselves of the commercial testing facilities, with a profit

added. That cost would be apparent in the cost of the equipment to consumers, who would be made to pay higher prices for goods.

The effect would be that radio devices produced by small companies would cost more to bring to market than those produced by large entities which can afford to construct and operate their own test facilities. This advantage in a highly competitive marketplace might easily force smaller operators out of the market and their attendant advances in radio technology would be lost in the bargain.

If American consumers were being provided with necessary safety by such results, there might exist some justification for this affect on the marketplace. However, there does not exist a single scientific study which supports the proposition that low-powered, unlicensed radio devices are a threat to persons' health. Nor does anything within the NPRM suggest that such a finding has been or will be made, or that even if such a finding were to be made in the future, that the testing to be performed will result in the Commission's taking actions against the future authorization of low-powered, unlicensed devices.¹

¹ Linear does not believe that the Commission intends to curtail the future production of unlicensed radio devices, hand-held transceivers, and the millions of other products which would require testing under the proposed rules. Unless the Commission is prepared to state that the future production of these devices is presently threatened by its actions, it appears that its actions are little more than extremely expensive posturing, without any tangible result to be forthcoming.

It should further be noted that the likelihood that an unlicensed radio device would fail to meet the Commission's proposed standards is extremely remote. In fact, Linear cannot conceive of any product or design in existence which would both comply with the Commission's emissions limitations under Part 15 and simultaneously violate the proposed standards. Nor has the Commission suggested that such a device exists or might exist. Since, by their very nature, these devices comply with the Commission's proposed standards; forcing manufacturers to test to demonstrate compliance with standards which the Commission knows are met is a waste of all parties' time, energies and resources.

To avoid economic waste and to fulfill its duty to safeguard the environment, the Commission might simply admit the obvious (or at least the unrefuted) -- that unlicensed radio devices will, under all circumstances known or reasonably expected, meet and exceed the Commission's proposed safety standards. Once this premise is admitted, the need to require testing of these devices is relieved. Accordingly, Linear requests that prior to the adoption of the proposed rules, the Commission demonstrate with reasonable certainty that the reality of design and operation do not make such premise axiomatic and wholly reliable for the promulgation of regulation. And if the Commission accepts that this premise is correct, the Commission should continue to exclude unlicensed device manufacturers from the requirement and extreme cost of demonstrating a known result.

The Commission's Resources Would Be Wasted

Linear presumes that the adoption of the proposed rules would require applicants for equipment authorization to provide Environmental Assessments (EA) to demonstrate compliance with the Commission's Rules. The EAs would require processing by the Commission's staff to determine whether proper testing procedures were employed and whether the results demonstrated compliance. Accordingly, the Commission's resources would be taxed further to determine whether devices might cause a safety hazard.

As the Commission is well aware, its resources are already strained. Linear does not believe that the Commission should invite a greater burden upon itself that cannot be shown to support any public good. In the instant matter, the Commission has not shown that unlicensed devices or low powered devices will create any environmental harm. The Commission has not shown that even with the standards proposed, the public will enjoy a higher level of safety. The Commission has not shown that there exists a likelihood that continued production of radio devices under the current rules will create a potential risk to public safety or that, even if it is determined that under certain, isolated, extremely rare cases a safety hazard might exist, that the proposed rules will prevent such situation from occurring. In sum, the Commission has not demonstrated that its proposed rules are necessary or will produce some desirable result. Absent such a showing, the Commission should resist expending its ever decreasing resources to regulate in this manner.

The ANSI/IEEE Standard is Overbroad

The most effective and beneficial FCC Rules are narrowly drafted to address the specific issues and parties in need of regulation.² The proposed rules are drafted too broadly, which will cause regulated parties to incur unnecessary expense and consumers to be misled. The 1992 ANSI/IEEE standard is overbroad because it imposes burdensome requirements and restrictions on a wide array of electronic devices for which there is no evidence of hazardous levels of electromagnetic radiation. As a result, if the FCC adopts the new ANSI/IEEE standard, the electronics industry will be forced to pay for compliance efforts which are wholly unnecessary for consumer safety.

If the FCC adopts the 1992 ANSI/IEEE standard, the producers of a multitude of electronic devices, including audio systems, video systems, receivers and transmitters will be required to make an affirmative showing that their devices emit no hazardous RF radiation from 3 KHz to 300 GHz.³ This requirement is enormously burdensome on manufacturers compared to the current rule, which requires producers to measure emissions over a lesser frequency range to confirm that the product at issue does not exceed the Commission's

² The Commission's present environmental rules are location specific, providing a controlled, known environment for demonstration of compliance.

³ The radiation standards proposed attempt to create a baseline for proof of a negative proposition, i.e. that radiation below the limitations are either "safe" or acceptable and therefore, do not pose a hazard. Proof of a negative proposition is obviously a dangerous method for the adoption of regulations and inevitably becomes an impossible task as the definition of "no hazard" is changed over time.

emission limitations.⁴ To comply with the 1992 ANSI/IEEE standard, producers will be forced to purchase or lease costly specialized equipment, perform extensive testing and incur additional administrative expenses. Such costs must be justified.

Instead, the Commission has accepted unjustifiable presumptions. First, that electromagnetic radiation from low powered devices causes harm to humans. Second, that devices emitting below the proposed standards do not cause such harm. Third, that low powered, licensed devices which presently comply with the Commission's emission limitations will not always comply with the Commission's proposed standards. And fourth, that unlicensed devices which meet the Commission's emission limitations under Part 15 will not always comply with the Commission's proposed standards.

Unlike the Commission in its proposal, Linear does not accept these premises. The Commission has not demonstrated that the premises are, in fact, accurate and has relied on, at best, inconclusive data. Were it not for the enormous economic impact and potential for waste which will flow from adoption of the Commission's proposed rules, such presumptions might not cause alarm. However, given the extreme costs to manufacturers arising out of adoption, which are admitted by the Commission in its NPRM, Linear cannot lightly excuse the quantum leaps of logic which are the basis for the Commission's proposed requirement.

⁴ Reasonable persons may question the need for the proposed rules based on the proposition that the FCC's present rules require a demonstration of "worst case" received radiation levels. What more, then, is there to be gained by quantifying the same data, employing a different measurement technique?

Accordingly, to avoid an arbitrary and capricious result which will cause great harm to manufacturers and consumers alike, the Commission must first determine with absolute certainty that the bases for its proposed requirements are accurate. Failing that, the Commission creates overbroad rules that protect consumers from a non-existent threat.

Consumers Should Not Be Unnecessarily Frightened Or Misled

Another problem likely to arise from the 1992 ANSI/IEEE standard is that the public will be confused and misled with regard to the hazards connected with the use of electronic devices. In his statement of March 11, 1993, Commissioner Duggan raised the issue of the public's perception regarding the safety of FCC-approved equipment. This is an extremely important issue because it impacts both consumer safety and industry earnings. If the FCC requires warning labels on electronic equipment when there is no evidence of hazardous electromagnetic radiation, the public will be either unnecessarily alarmed, or, worse yet, unable to distinguish superfluous warnings from those which are important to their safety. Furthermore, the imposition of unnecessarily stringent requirements is likely to be misinterpreted by both the media and the public. If consumers are wrongfully lead to believe that electronic equipment poses health hazards, electronics industry revenues are likely to suffer. If the FCC adopts the new standard, the resulting public misconceptions could be harmful to consumers and damaging to the electronics industry.

The Full Text of the Standard is Not Available

The full text of the 1992 ANSI/IEEE standard is available for purchase from the IEEE in New Jersey or for inspection at the FCC in Washington, DC. The text was temporarily out of print through mid-July, and then available only at a cost of \$37.80 for IEEE members and \$54.00 for non-members. As a result, interested parties outside of the capital area have not had access to the full text of the standard until a few weeks before comments are due, and then only at a cost which discriminates against non-IEEE members. Given the complexity of the issues and the need to spend sufficient time scrutinizing the data and underlying scientific analysis which must be present to justify such a demand on manufacturers, it is incredible that this rule making has been allowed to go forward.

The full text of the standard should be available from the government printing office at a reasonable charge. Industry standards which are to be incorporated into FCC Rules should be made available to interested parties in a fair and non-discriminatory manner. The IEEE standard was not available for purchase in time to allow sufficient opportunity for analysis, and non-IEEE members must pay more for the text than members. This is inappropriate in a federal rulemaking context; all interested parties should have fair and equal access to the standard.

Linear further notes that the standards are, in fact, protected by copyright. Again, this condition is outrageous. The document could not be obtained from IEEE until recently. When obtained, non-members must incur discriminatory pricing for the document. The

document could be inspected, but not copied, at the Commission's offices in Washington, D.C., thereby requiring that interested commenters must travel to Washington to avoid IEEE's discriminatory pricing practices or lack of adequate inventory.

It is, therefore, apparent that the Commission's obligation to receive meaningful comments has been severely curtailed by the nature of the limited distribution of the relevant materials. Linear contends that the Commission has provided inadequate notice and opportunity for comment and has, thus, violated the basic tenets of the Administrative Procedures Act in his handling of this procedure. Since no remedy has been provided to Linear or other interested persons, Linear suggests that the Commission restart this proceeding following correction of these glaring procedural weaknesses.

Due Process In Creation Of The Standards

The NPRM states that the standards have been created by leading scientists and standards committees. Despite the credentials of the participants, their efforts cannot withstand scrutiny when one considers two necessary issues: Was the electronics industry provided with adequate due process protections in the creation of the proposed standards? And were these standards created with the intent that they might be adopted as law? These issues are of paramount importance in determining whether reasonable regulation is, in fact, possible.

Linear has no method of determining whether the persons who comprised the groups that created the standards were forwarding the interests of consumer safety or the interests of their employers. If those persons were acting in accord with their legal and ethical duty, they were forwarding the interests of their employers. Such action is, on one hand, laudable for the purpose of meeting their obligations arising out of an employee-employer relationship. It is, however, not a proper basis for the creation of regulation. Accordingly, Linear contends that the proposed standards are not a little bit suspect in the manner in which they were created. They are, instead, in grave doubt.

Linear also does not know whether the efforts of the committees were intended to be adopted into law. If that was the intent, then the committees had an obligation to provide notice and opportunity for comment. Linear is not aware of any such opportunity which has been made to the general public. If the standards were not created with the purpose being that they would be adopted into law, then there is grave doubt as to whether the Commission should do so. Obviously, a purely scientific effort might create standards which are useful in a laboratory setting, but which might fail miserably as a codified standard at law.

These questions of the proper provision of due process guarantees and the intent of the drafters must be determined and shown prior to the Commission's acting, so as to avoid procedural error and errors in rational application of the standards. Linear has already questioned *supra* the validity of the standards as they might apply to low power radio devices. Linear suggests that the standards, if valid for any purpose, should be viewed as an

interesting scientific study, but legally and logically flawed for the purpose of creating or amending the Commission's Rules.

Products Operated On or Near the Body

Under current FCC provisions, many commonly used low-power electronic devices are excluded from FCC requirements addressing RF radiation because data indicates that such products will not violate ANSI guidelines. If adopted, the 1992 ANSI/IEEE standard would require testing of products operating from 3 KHz to 300 GHz, and would eliminate the application of the current exclusion to hand-held devices which are operated within 2.5 centimeters of the body. Conceivably, the new rule could require the testing of all electronic devices operated by hand, including telephones, electronic wristwatches, and portable stereos, as well as Part 15 transmitters used for emergency signaling, garage remote controls and home security.

As the Commission has pointed out, data shows that it is extremely unlikely that low-power electronic devices will emit radiation at hazardous levels. Furthermore, Part 15 devices are short duration devices which are designed to operate at minimal RF power levels.

Elimination of the low-power exclusion will require testing of virtually all hand held portable electronic devices, regardless their low power level or lack of threat to consumer safety.

It is important to not underestimate the impact that the new standard would have on the electronics industry. To comply with the standard, manufacturers will expend enormous amounts of financial, administrative and human resources on product testing for which there is no logical basis. Given that testing costs will be high and that there is no evidence indicating that devices operated at low power levels cause any health risks whatsoever, eliminating the exclusion for low power devices will impose an arbitrary and illogical burden on the electronics industry.

In fact, recent studies performed by the Cellular Radio industry indicate that there is no hazard arising out of operation of hand-held transceivers. The Cellular industry spent millions of dollars to determine whether a threat to consumer safety existed and the study demonstrated that no such threat existed. Linear contends that the comprehensive study performed by the Cellular Radio industry reflects a level of competence which is, at least, equal to those performed by the authors of the proposed standard. It, therefore, appears that the Commission's proposed rules fly in the face of the most recent efforts and studies.

For the Commission to require compliance with such a costly testing requirement, it is incumbent on the Commission to assure affected parties that their efforts will be performed in the public interest. Considering the most recent evidence produced in this area, the Commission is not positioned to provide such assurances.

Hand Held Radio Receivers and Transmitters

Under the current FCC Rule, hand held radio receivers and transmitters operated at 7 watts or less are excluded from RF radiation requirements. The present exclusion is appropriate because hand held two-way radio devices are designed to be carried on the body and used by holding a remote speaker or microphone near the mouth. Furthermore, the battery limitations and practical considerations prevent these types of devices from transmitting more than 7 watts of power.

Under the 1992 ANSI/IEEE standard, the present exclusion will be eliminated and every hand held radio receiver and transmitter will require testing for hazardous RF and magnetic radiation. In addition, manufacturers may be required to attach labels to these devices warning users about exposure to electromagnetic radiation.

The new standard does a disservice to both the electronics industry and the public. Testing every hand held two way radio device is unnecessary because there is no indication that radios operating at low power levels expose users to harmful levels of radiation, and costly because to implement the testing requirements, manufacturers will have to purchase new equipment and incur added administrative expenses. Furthermore, as is the case with electronic devices operated on or near the body, superfluous product warnings unnecessarily alarm and mislead the public.

Commercial/Amateur Radio Installations

Like hand held radio receivers and transmitters, many low-power, intermittent, or normally inaccessible RF transmitters and facilities, including commercial and amateur radio installations, are currently excluded from FCC rules addressing RF radiation.⁵ If the Commission adopts the 1992 ANSI/IEEE standard, this exclusion will be eliminated and both commercial and amateur operators will be restricted from operating at legally permissible power levels.

Amateur radio operators' base stations usually operate at power levels of 100 to 250 watts in the HF radio bands, and 10 to 25 watts with 6 to 10 dB gain antennas in the VHF and UHF range. With an antenna height of 6 meters or less, the effective radiated power (ERP) of an amateur operator's station may easily exceed 100 watts. Presently, amateur operators are often prevented from communicating effectively when homeowners' associations prevent the operators' antennas from extending above the roofline of a home.

If the Commission adopts the new standard, both amateur and commercial operators will have to obtain field intensity surveys certifying that their installations do not exceed the ANSI/IEEE radiation standards from 3 KHz to 300 GHz. Furthermore, under the new standard, retests of field intensity and new warning labels will be required any time an amateur or commercial operator changes antennas, feedline, tower height or transceivers.

⁵ Even under the proposals, it cannot be determined with certainty whether amateur radio facilities would be considered as operational in a "controlled" or "uncontrolled" environment. Either might be argued convincingly.

If adopted, this new requirement will yield two significant problems for amateur and commercial radio operators. First, the field intensity surveys which will be necessitated by the standard are unnecessary and expensive. As the Commission has indicated, measurement data shows that it is extremely unlikely that the RF radiation standards will ever be exceeded by low-power or intermittent RF transmitters and facilities. Furthermore, field intensity surveys are expensive and will create a significant financial burden, especially for amateur operators.

Another problem which will arise from the new standard is that homeowners and other property owners located near the effected radio stations are likely to be unnecessarily alarmed by the required radiation surveys. Lay persons' unfounded fears with regard to "hazardous" levels of radiation will cause unnecessary disputes and could yield frivolous yet costly lawsuits.

Commercial/Amateur Mobile Installations

Presently, mobile radio stations are excluded from the Commission's rules regarding RF radiation. If adopted, the 1992 ANSI/IEEE standard will eliminate this exclusion and cause severe difficulties for mobile radio stations. Commonly used VHF/UHF mobile transceivers operate at 25 to 50 watts. With a 3 to 6 dB gain roof mounted antenna, these stations' ERP will exceed the standard. As a result, operators may be required to display labels warning the public that their equipment emits hazardous radiation, and under certain circumstances mobile radio users could be required to stop transmitting because their

equipment is causing a health hazard. The new standard should not be adopted because there is no evidence showing that mobile installations cause health threats to the public, and because the standard will yield burdensome and absurd results.


Conclusion

The 1992 ANSI/IEEE standard is overbroad and unnecessary to protect public health. Furthermore, the compliance measures which would be required under the standard would create undue economic hardship on both the electronics industry and commercial and amateur radio station operators. For these and the foregoing reasons, we respectfully request that the FCC not adopt the 1992 ANSI/IEEE standard.

Respectfully submitted,

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Dated: August 13, 1993

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